MULTIFUNCTIONAL UI INPUT DEVICE FOR MOBLIE TERMINALS

TECHNICAL FIELD OF THE INVENTION

[0001] The invention relates to an UI (User Interface) input device and especially to a multifunctional UI input device for mobile terminals.

BACKGROUND OF THE INVENTION

[0002] Different kinds of mobile terminals comprising UI input devices are known from prior art such as portable computers or laptops, cellular telephones and personal digital assistants (PDA). Thus there are also provided lots of solutions for inputting data to these mobile terminals. The best-known UI input devices among other things are buttons, sensitive touch pad or plate mouse and pen-usable touch screen. Also voice commands are known from prior art to use for inputting data or controlling different kind of functions, such as for example call up to predetermined number.

[0003] There are, however, some disadvantages in the prior art solutions for example when UI input devices known from prior art are used in tightly packed format, such as in traditional cellular telephones. For instance, the traditional way of putting the keyboard to the same side of the terminal where the display locates makes the keyboard and display to be smaller than desired and especially if the form- and size-factor trends are followed. Further some disadvantages relate also to use of touch-screen in a terminal such as poor optical performance and easily breakable structure, which features are not optimal for use in high-accuracy graphical displays that are carried around. Also pen-input UI devices are cumbersome because the pen is typically small and easy to lose.

SUMMARY OF THE INVENTION

[0004] An object of the invention is to solve the problem of how to implement easy to use user interface (UI), which offers maximized size of display and graphical input means, into tightly packed and easy-to-carry format. An additional object of the invention is also to solve the problem of how to efficiently use most of the surface area of the terminal for UI purposes. Further object of the invention is also to offer a familiar qwerty-type keyboard also to user of small mobile terminals without reducing the area of display. One additional object of the invention is also to mechanically protect the terminal against pressure, push and mechanical stress. One further additional object of the invention is to make possible to use fingers of both hands at the same time for managing the data effectively on the display.

[0005] The objects of the invention are fulfilled providing a mobile terminal with a touch pad UI, where the touch pad UI is separated from the display unit into the discrete unit and where the touch pad UI at least in one mode is arranged into the back side of the mobile terminal (an opposite side of the side where the display locates) so that a user can operate the touch pad UI device by his same finger by which he supports the mobile terminal at the back side when using the terminal. The touch pad UI may be flipped to the back side of the mobile terminal in a flip-type terminal construction, where the touch pad UI is hinged to the mobile terminal or alternatively the touch pad UI may be fixedly located in the back side of the mobile terminal in a monoblock-type terminal construction. In second mode the touch pad may be flipped to a certain angle (horizontal position) relative to the terminal in a flip-type terminal construction. In addition the objects of the invention are achieved by arranging the touch pad UI to recognize movements of the user finger on the touch pad independently of the position angle of the touch pad UI relative to the terminal and move a cursor on the display of the terminal and read input commands according to the movements of the finger.

[0006] The following notions are used in this application:

[0007] "Flip-type terminal construction": A flip-type terminal construction comprises a touch pad UI input device hinged to the mobile terminal by a hinge. Further in the flip-type terminal construction, three main usages for the solution can be applied:

[0008] 1° Touch pad UI is closed: a touch pad and display is mechanically protected,

[0009] 2° Touch pad UI is opened not over than approximately 180°: a touch pad is used in the same way as an input device in laptops, and

[0010] 3° Touch pad UI is opened approximately 360° opened: two-hand mode, where a touch pad is a pointing/input device using tips of middle fingers—no pen is needed!

[0011] "Monoblock-type construction": A touch pad UI input device is located in outer surface of a B-cover (or Functional Cover) in a monoblock construction. In monoblock-type terminals the implementation can be either integrated or in form of functional cover.

[0012] "Touch pad UI": A touch pad UI, or more precisely a multifunctional touch pad user interface device, typically comprises functionality for numbers of functions, such as determining movements of at least one fingertip on the surface of the touch pad UI. The touch pad UI advantageously comprises touch sensitive area for determining the movements of the finger on the surface of the touch pad. Additionally the touch pad UI may comprise a pressure sensitive means under the touch pad surface, for example, for determining the presses of the finger on the touch pad, so that a user could do point and click—operation as normally done with a mouse, for example. According to an embodiment of the invention the position of the cursor is determined by the position of a fingertip on the touch pad, and clicking is achieved by pressing the touch pad with the same finger. Clicking may be achieved also by pressing a certain button locating, for example, in the front side of a mobile terminal. The button may be pressed for example by a thumb.

[0013] "Two-hand-mode": In this mode the touch pad UI is either fixedly arranged or alternatively flipped into the back side of a mobile terminal (opposite side of the display side) so that in use a user can see the display side of the mobile terminal in the field of vision, support the mobile terminal by his fingers at the back side and at the same time input data through the touch pad locating in the back side of the mobile terminal by using the same fingers by which he supports the mobile terminal and further seeing a cursor moving on the display of the mobile terminal following the movements of his finger on the touch pad UI at the same time when he is moving his finger on the touch pad UI.